

## CLAIMS

1. A method for producing an article coated with a titanium compound film characterized in that a titanium target containing 1 to 45 at% of a metal with two or more times higher sputtering yield than that of titanium in an argon atmosphere is used in forming the titanium compound film on a substrate by a reactive sputtering process.

2. A method for producing an article coated with a titanium compound film characterized in that a titanium target containing 1 to 20 at% of a metal with two or more times higher sputtering yield than that of titanium in an argon atmosphere is used in forming the titanium compound film on a substrate by a reactive sputtering process.

3. The method for producing an article coated with a titanium compound film

according to any one of claims 1 and 2, characterized in that the titanium target

containing the metal contains a third metal other than titanium and the metal.

4. The method for producing an article coated with a titanium compound film

according to claim 4, characterized in that the third metal other than the titanium and

the metal is at least one of iron and molybdenum.

5. The method for producing an article coated with a titanium compound film

according to claim 3 or 4, characterized in that the titanium target containing the metal

contains 0.01 to 10 at% of the third metal.

6. The method for producing an article coated with a titanium compound film

according to any one of claims 1 to 5, characterized in that heating or heat treatment is

carried out during and/or after film formation in a method for producing the titanium compound film.

7. The method for producing an article coated with a titanium compound film according to any one of claims 1 to 6, characterized in that the titanium compound is a titanium oxide.

8. The method for producing an article coated with a titanium compound film according to any one of claims 1 to 6, characterized in that the titanium compound is a titanium nitride.

9. The method for producing an article coated with a titanium compound film according to any one of claims 1 to 8, characterized in that a substrate coated with the film is a plate-shaped glass.

10. The method for producing an article coated with a titanium compound film

according to any one of claims 1 to 9, characterized in that the metal is tin.

11. The method for producing an article coated with a titanium compound film

according to any one of claims 1 to 9, characterized in that the metal is zinc.

12. An article coated with a titanium compound film having a photocatalytic

function or an optical function, produced by the method according to any one of

claims 1 to 11.

13. The article coated with a titanium compound film having a photocatalytic

function according to claim 12, characterized in that a crystalline zirconium oxide

layer, a zinc oxide layer, a magnesium oxide layer, a tin oxide layer, or an iron oxide layer is provided between the substrate and the titanium compound film.

14. An article coated with a titanium compound film containing a metal, wherein the metal has two or more times higher sputtering yield in an argon atmosphere than that of titanium and the metal content ratio of the metal to titanium is 1 to 45 at%.

15. An article coated with a titanium compound film containing a metal, wherein the metal has two or more times higher sputtering yield in an argon atmosphere than that of titanium and the metal content ratio of the metal to titanium is 1 to 20 at%.

16. The article coated with a titanium compound film according to any one of claims 14 and 15, wherein the metal is tin.

17. The article coated with a titanium compound film according to any one of claims 14 and 15, wherein the metal is zinc.

18. The article coated with a titanium compound film according to any one of claims 14 to 17, characterized in that the titanium compound is titanium oxide.

19. The article coated with a titanium compound film according to any one of claims 14 to 18, characterized in that a substrate of the article is plate-shaped glass.

20. A titanium target containing a metal, which is used for forming a titanium compound film on a substrate by a reactive sputtering process, characterized in that the metal has two or more times higher sputtering yield in an argon atmosphere than titanium and the metal content ratio of the metal to titanium is 1 to 45 at%.

21. A titanium target containing a metal, which is used for forming a titanium compound film on a substrate by a reactive sputtering process, characterized in that the metal has two or more times higher sputtering yield in an argon atmosphere than titanium and the metal content ratio of the metal to titanium is 1 to 20 at%.

22. The titanium target containing a metal according to any one of claims 20 and 21, characterized in that a third metal other than the titanium and the metal is contained in the titanium target containing the metal.

23. The titanium target containing a metal according to claim 22, characterized in that the content of the third metal is 0.01 to 10 at%.

24. The titanium target containing a metal according to claim 22 or 23, characterized in that the third metal is at least one of iron and molybdenum.

25. The titanium target containing a metal according to any one of claims 20 to 24,

wherein the metal is tin.

26. The titanium target containing a metal according to any one of claims 20 to 24,

wherein the metal is zinc.